CS3425: Lab 1.5
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1. Data Prep. Create the following tables and insert the sample data.

```
create table stu (
id char(4) primary key,
name char(30),
total_credit numeric(4,1)
) ;
insert into stu (id, name)
values ("S1", "Alice"),
("S2", "Jon"),
("S3", "Mike");
```

id	name	total_credit
▶ S1	Alice	NULL
S2	Jon	NULL
S3	Mike	NULL

```
create table course (
c_id char(6) primary key,
dept char (30),
credit numeric (2,1)
);
insert into course
values ("CS1121", "CS", 3),
("CS3425", "CS", 4),
("MA3425", "MATH", 4) ;
```

c_id	dept	credit
▶ CS1121	CS	3.0
CS3425	CS	4.0
MA3425	MATH	4.0

```
create table takes (
id char(4) references stu(id),
c_id char (6) references course(c_id),
grade char (1),
primary key (id, c_id)
);
insert into takes values
("S1", "CS3425", "A"),
("S1", "CS1121", "A"),
("S2", "CS1121", "A"),
("S2", "CS3425", null);
```

id	c_id	grade
▶ S1	CS1121	A
S1	CS3425	A
S2	CS1121	A
S2	CS3425	NULL

2. List the students who haven't registered any classes yet.

select id, name
from stu
where id not in (select id from takes);

select id, name
from stu natural left join takes
where takes.id is null;

id	name
S3	Mike

3. List student id, name and how many classes each student registered.

select id, name, (select count(*) from takes where id = stu.id) total_courses
from stu;

select id, name, count(takes.id) as total_courses
from stu natural left join takes
group by stu.id;

id	name	total_courses
S1	Alice	2
S2	Jon	2
S3	Mike	0

(select id, name, count(*) as total_courses
from stu natural join takes
group by id)
union
(select id, name, 0
from stu
where id not in (select id from takes)
);

4. List the student id, name and total_credits that they have earned

a.
select id, name, (select ifnull(sum(credit), 0)
from takes natural join course
where takes.id = stu.id and grade is not null) total_credit
from stu;

b.
select stu.id, name, ifnull(sum(credit),0) as total_credit
from stu natural left join takes natural left join course
where grade is not null or takes.id is null
group by stu.id;

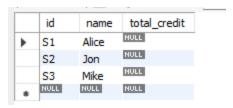| id	name	total_credit
S1	Alice	7.0
S2	Jon	3.0
S3	Mike	0.0

c.
select stu.id, name, ifnull(sum(credit),0) as total_credit
from stu
left join takes on (stu.id = takes.id and takes.grade is not null)
natural left join course
group by stu.id;

select stu.id, name, ifnull(sum(credit),0) as total_credit
from stu
natural left join (select id, c_id from takes where grade is not null) T
natural left join course
group by stu.id;

5. Update the total_credit column with the credit that student earned

update stu set total_credit=null;
select * from stu;
update stu
set total_credit = (select ifnull(sum(credit),0)
from takes natural join course
where takes.id=stu.id and grade is not null) ;
select * from stu;

id	name	total_credit
S1	Alice	NULL
S2	Jon	NULL
S3	Mike	NULL
NULL	NULL	NULL

id	name	total_credit
S1	Alice	7.0
S2	Jon	3.0
S3	Mike	0.0
NULL	NULL	NULL